

U.S. Patent Application No. 10/805,093
Amendment dated July 17, 2006
Responsive to Final Office Action Dated March 17, 2006

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims:

1. (Currently amended) Apparatus for associating information with a biological reagent, the apparatus comprising:

a carrier for supporting the biological reagent; and

at least one tag comprising a carrier antenna coupled to the carrier, wherein the tag is operable to be read by a reader and wherein the tag comprises licensing rights information for at least one of the carrier and the biological reagent, the licensing rights information being readable by the reader to at least one of authorize, validate, and authenticate use of at least one of the carrier and the biological reagent in a predetermined assay.

2. (Original) The apparatus of claim 1, wherein the carrier comprises a microarray.

3. (Original) The apparatus of claim 1, wherein the carrier comprises a surface plasmon resonance array.

4. (Original) The apparatus of claim 1, wherein the carrier comprises a reaction plate.

5. (Original) The apparatus of claim 1, wherein the carrier comprises a tube.

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6. (Original) The apparatus of claim 1, wherein the carrier comprises a tube carrier for holding a plurality of tubes.

7. (Original) The apparatus of claim 1, wherein the carrier comprises a microfluidic card.

8. (Original) The apparatus of claim 1, wherein the carrier RFID antenna is embedded in an interior portion of the carrier during a carrier manufacturing process.

9. (Original) The apparatus of claim 1, wherein the carrier RFID antenna is adhesively applied to at least part of an exterior portion of the carrier.

10. (Previously presented) The apparatus of claim 1, further comprising:
at least one instrument having an instrument tag reader for reading the rights information;
and
at least one output interface that provides output information regarding an identification of the biological reagent while the instrument is performing operations in connection with the biological reagent.

11. (Original) The apparatus of claim 10, wherein the instrument comprises a non-transparent enclosure that substantially prevents optical scanning of a barcode on an object positioned within the instrument.

12. (Previously presented) The apparatus of claim 1, wherein the at least one tag comprises at least one RFID tag.

13. (Previously presented) The apparatus of claim 1, wherein the at least one tag comprises at least one microwave RFID tag.

14. (Canceled)

15. (Currently amended) Apparatus for associating information with a biological reagent, the apparatus comprising:

a carrier for supporting the biological reagent; and

at least one RFID tag comprising a carrier RFID antenna coupled to the carrier, wherein the RFID tag is operable to be read by an RFID reader and wherein the RFID tag contains licensing rights information for at least one of the carrier and the biological reagent, the licensing rights information being readable by the RFID reader to at least one of authorize, validate, and authenticate use of at least one of the carrier and the biological reagent in a predetermined assay.

16. (Canceled)

17. (Original) The apparatus of claim 15, wherein the rights information is adapted to be read by a biological instrument for reagent processing, the biological instrument comprising a reader for the RFID tag.

18. (Previously presented) The apparatus of claim 15, wherein the licensing rights information further comprises information regarding a number of times the biological reagent can be used in connection with a particular assay.

19. (Previously presented) The apparatus of claim 15, wherein the licensing rights information comprises information regarding whether the biological reagent has been subject to a recall.

20. (Currently amended) Apparatus for associating licensing rights information with a microarray, the apparatus comprising:

a substrate;

the microarray; and

an RFID tag having an RFID antenna coupled to the substrate,

wherein the licensing rights information comprises information on whether a user has a valid license to use the microarray in a predetermined assay.

21. (Original) The apparatus of claim 20, wherein the RFID tag comprises nucleic acid sequence information and location information for at least one unique oligonucleotide spot in the microarray.

22. (Original) The apparatus of claim 20, wherein the RFID tag comprises pattern information for at least one spot pattern associated with at least one assay for the microarray.

23. (Original) The apparatus of claim 20, wherein the substrate comprises a first surface and a second surface, wherein the first and second surfaces face in opposing directions, and wherein a chamber is positioned upon the first surface of the substrate.

24. (Original) The apparatus of claim 23, wherein at least a portion of the RFID antenna is affixed to the second surface face of the substrate.

25. (Original) The apparatus of claim 23, wherein at least a portion of the RFID antenna is located between the first and second surfaces of the substrate.

26. (Original) The apparatus of claim 23, wherein the RFID antenna is positioned substantially along a periphery of the substrate.

27. (Original) The apparatus of claim 23, wherein the RFID antenna is affixed to at least a portion of a margin inside a periphery of the substrate.

28. (Currently amended) Apparatus for associating information with a biological reagent, the apparatus comprising:

a carrier for the biological reagent, the carrier coupled to an RFID tag, wherein the RFID tag is operable to be read by an RFID reader and wherein the RFID tag contains licensing rights information, the licensing rights information being readable by the RFID reader to at least one of authorize, validate, and authenticate use of at least one of the carrier and the biological reagent in a predetermined assay; and

at least one instrument for reading the identification information, and performing operations on the biological reagent, the instrument comprising an output for providing an authorization indication of the biological reagent based on the licensing rights information, wherein the instrument is generally opaque, thereby blocking optical paths to contents of the instrument.

29. (Currently amended) Apparatus for associating information with a biological reagent, the apparatus comprising:

a carrier for supporting the biological reagent; and

at least one RFID tag comprising a carrier RFID antenna coupled to the carrier, wherein the RFID tag is operable to be read by an RFID reader and wherein the RFID tag comprises instrument operation information for the biological reagent, the instrument operation being readable by the
RFID reader to at least one of authorize, validate, and authenticate at least one instrument operation
associated with the biological reagent.

30. (Original) The apparatus of claim 29, further comprising a biological instrument controller coupled to a biological instrument, the biological instrument coupled to the RFID reader, wherein the biological instrument comprises: instrument hardware, instrument firmware, and instrument data collection software.

31. (Original) The apparatus of claim 30, wherein the biological instrument controller comprises a general purpose computer, the general purpose computer coupled to the biological instrument via a data network connection that is operable to carry the instrument operation information between the general purpose computer and the biological instrument.

32. (Original) The apparatus of claim 30, wherein the instrument operation information comprises parameters for defining operation of the instrument data collection software.

33. (Original) The apparatus of claim 30, wherein the instrument operation information comprises parameters for defining operation of the instrument firmware.

34. (Original) The apparatus of claim 29, wherein the instrument operation information comprises ASCII encoded, human readable module information that defines the behavior of the biological instrument.

35. (Original) The apparatus of claim 29, wherein the instrument operation information comprises ASCII encoded, human readable method information that defines the behavior of the biological instrument.

36. (Original) The apparatus of claim 29, wherein the instrument operation information comprises instructions for the operation of a sample pump coupled to the biological instrument.

37. (Original) The apparatus of claim 29, wherein the instrument operation information comprises instructions for control of a mechanical robot for physically manipulating the biological reagent coupled to the biological instrument.

38. (Original) The apparatus of claim 29, further comprising a biological instrument controller coupled to a biological instrument, the biological instrument coupled to the RFID reader, wherein

the biological instrument receives the instrument operation information and, based on the instrument operation information, performs at least one instrument operation.

39. (Previously presented) A method for associating information regarding biological reagents with carriers for supporting the biological reagents, the method comprising:

 providing a carrier for at least one biological reagent, the carrier coupled to tag, wherein the tag is operable to be read by a tag reader; and

 receiving, from the tag, real-time physical location information associated with the biological reagent.

40. (Original) The method of claim 39 further comprising: tracking the biological reagent as the biological reagent undergoes a reagent manufacturing process.

41. (Canceled)

42. (Previously presented) The method of claim 41, wherein receiving the real-time physical location information comprises receiving triangulation parameters from a plurality of triangulation tag readers proximate to the tag.

43. (Previously presented) The method of claim 40, wherein receiving the real-time physical location information comprises receiving GPS coordinates from a GPS receiver physically coupled to the carrier.

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44. (Previously presented) The method of claim 39 further comprising:
maintaining a threshold inventory quantity of units of the biological reagent based on a count of the carriers established by reading the tag associated with the units.

45. (Currently amended) A method for associating information regarding biological reagents with carriers for supporting the biological reagents, the method comprising:

providing a carrier for a biological reagent, the carrier coupled to an RFID tag, wherein the RFID tag is operable to be read by an RFID reader;

receiving, from the RFID tag, licensing rights information and supplemental information associated with the biological reagent, the licensing rights information being readable by the RFID reader to at least one of authorize, validate, and authenticate use of at least one of the carrier and the biological reagent in a predetermined assay; and

reading genealogy information regarding the biological reagent while the biological reagent is utilized in a biological assay.

46-51. (Canceled)

52. (Original) The method of claim 45, wherein the supplemental information comprises material safety data sheet (MSDS) information.

53. (Original) The method of claim 45, wherein the supplemental information comprises work order number information.

54. (Original) The method of claim 45, wherein the supplemental information comprises customer identifier information.

55. (Original) The method of claim 45, wherein the supplemental information comprises customs service information.

56. (Original) The method of claim 55, wherein the customs service information comprises country of origin information.

57. (Original) The method of claim 45, wherein the supplemental information comprises lot number information.

58. (Original) The method of claim 45, wherein the supplemental information comprises batch number information.

59. (Currently amended) A method for associating information regarding biological reagents with carriers for supporting the biological reagents, the method comprising:

providing a carrier for a biological reagent, the carrier coupled to an RFID tag, wherein the RFID tag is operable to be read by an RFID reader; and

receiving, from the RFID tag, licensing rights information associated with the biological reagent; and

authorizing under terms of a license associated with the licensing rights information, use of the biological reagent in a predetermined biological assay.

60. (Canceled)

61. (Original) The method of claim 59 further comprising:
receiving license identifier information from the RFID tag;
authenticating the license identifier information; and
based on the authenticated license identifier information, permitting the performance of at least one licensed activity in connection with the biological reagent.

62. (Original) The method of claim 61, wherein the at least one licensed activity comprises a biological assay performed on a separately licensed instrument.

63. (Original) The method of claim 61, wherein the license identifier information comprises a digital signature.

64. (Original) The method of claim 59 further comprising: validating integrity of the biological reagent for use in connection with a specific biological assay.

65. (Original) The method of claim 64, wherein validating of the integrity of the biological reagent comprises: employing at least a portion of the rights information in a recall-list lookup operation to determine whether the biological reagent has been subject to a recall.

66. (Currently amended) A method for associating information regarding operations for biological reagents with carriers for supporting the biological reagents, the method comprising:

providing a carrier for at least one biological reagent, the carrier coupled to an RFID tag, wherein the RFID tag is operable to be read by an RFID reader; and receiving, from the RFID tag, instrument operation information associated with the biological reagent, the instrument operation information being readable by the RFID reader to at least one of authorize, validate, and authenticate at least one instrument operation associated with the biological reagent.

67. (Original) The method of claim 66, wherein the instrument operation information comprises parameters for controlling software on a biological instrument coupled to the carrier.

68. (Original) The method of claim 66, wherein the instrument operation information comprises at least one sequence of operations to be performed on a biological instrument coupled to the carrier.

69. (Original) The method of claim 66, wherein the instrument operation information comprises at least one set of conditions for changing states within a software-implemented state machine in a biological instrument coupled to the carrier.

70. (Previously presented) The apparatus of claim 1, wherein the licensing rights information comprises at least one of information relating to whether a user has a valid license to use the carrier, information relating to whether a licensee has a valid license to use the reagent, and information relating to whether the carrier or the reagent is subject to a recall.

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71. (Previously presented) The apparatus of claim 10, wherein the instrument is configured to authorize use of at least one of the carrier and the reagent under terms of a license.

72. (Previously presented) The apparatus of claim 71, wherein the instrument is coupled to a network and configured to authenticate use of the instrument based on the licensing rights information.